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Transport stirrup jars – so-called because of the shape formed by their handles and false neck – are a common type of Mycenaean pottery:<sup>1</sup> used to transport and store liquid commodities, usually assumed to be olive oil,<sup>2</sup> they are found throughout the central and eastern Mediterranean. A small sub-group of these carry painted inscriptions in the Linear B script, mainly consisting of personal and/or place names.<sup>3</sup> These inscribed stirrup jars (ISJs), dating from around the LM IIIB period (late 14<sup>th</sup> – early 12<sup>th</sup> centuries B.C.), are so far only certainly attested on Crete and the Greek mainland.<sup>4</sup> They form the only significantly-sized group of Linear B inscriptions found on a medium other than the more typical clay tablets:<sup>5</sup> the next largest group, of inscriptions painted on domestic pottery, includes only ten examples, and it is difficult to judge how far these form a coherent group with a shared function.<sup>6</sup> Not only that, but the ISJs are the most geographically widespread type of Linear B inscriptions, found both in and outside

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1 There are two types of stirrup jars: large, coarse-ware ‘transport’ jars, and smaller, fine-ware jars. This article is concerned primarily with the former type, as inscriptions are found only on these; references to ‘stirrup jars’ (SJs) therefore refer to the transport variety unless otherwise specified (for a list of abbreviations used, see p. 105).

2 Most of the (limited) textual and archaeological evidence points towards SJs containing oil, but other commodities such as wine are also possible (*TSJ*: 5, French 2011: 70–1, French 2013).

3 Many have only a single personal name (PN); the longer inscriptions usually read PN (nom.) + toponym + PN (gen.). This structure, and the identities of the names, will be discussed in **Sections 2** and **3**. Some ISJs also carry the adjective *wa-na-ka-te-ro* (*wanakteros*, ‘relating to the *wanax* [king]’), or its abbreviation *wa* (pp. 84–5).

4 For a possible example from the Levant, see p. 86, n. 69.

5 Around 180 jars and fragments have been identified as ISJs. Many of these, however, have only single signs that are too fragmentary to identify (and not certainly Linear B), or isolated signs which are probably ‘potmarks’ rather than inscriptions (*CIV*: 207–10). Excluding these, I count 122 published ISJs, of which 99 have more than one sign preserved; only 14 have more than one word preserved (texts of these 14 are given in **Appendix B**). del Frio 2012, Sacconi 2012, and *TSJ*: 103 list a further 19 unpublished fragments with (possible) Linear B signs.

6 See pp. 82–3.

of administrative centres, and, uniquely, are known to have travelled from Crete to the mainland.<sup>7</sup>

Due to this unique status, the ISJs have been used as evidence for issues ranging from the spread of Mycenaean literacy and the place of writing in Mycenaean society<sup>8</sup> to the debate over the dating of the main tablet archive at Knossos and the broader picture of LM IIIB Crete: since the majority of ISJs were produced in western Crete, they are central to the discussion of whether this period saw continued Knossian control over much of the island, or the rise of regional centres, particularly Khania.<sup>9</sup> However, there still remains considerable debate over many aspects of the ISJs themselves – ranging from the literacy of their painters to the inscriptions' intended function. It was originally assumed that they acted as a form of 'trademark', advertising Cretan oil producers to the mainland market.<sup>10</sup> This theory later became regarded as anachronistic,<sup>11</sup> and it was suggested that the inscriptions instead fulfilled an administrative function on Crete, identifying either the potters making the jars,<sup>12</sup> or those producing their contents.<sup>13</sup> Most recently, Duhoux 2011 suggests that the ISJs were indeed aimed at the mainland Mycenaean, but as symbols of prestige, marking items sent as part of a system of gift-exchange; Driessen *et al.* forthcoming, following this hypothesis, further suggest that the inscriptions functioned as 'name cards'. It has also been suggested that some of the inscriptions are purely decorative in function, not intended to be read – an issue closely linked to the debate on the literacy of their painters.<sup>14</sup>

The aim of this article is therefore to investigate these possible functions for the ISJs, using as evidence all aspects of the jars, from the palaeography and content of the inscriptions themselves to the jars' archaeological contexts and the results of scientific analysis.

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7 The only other form of Linear B inscription likely to have travelled are sealings, which would have been transported only between outlying areas and the administrative centre (Younger 2010: 333–7).

8 Palaima 1987.

9 E.g. Palmer 1971 vs. Haskell 1983, Palaima 1984.

10 Chadwick 1976: 18, Haskell 1983: 124.

11 van Alfen 1996–1997: 261–62; see p. 89.

12 Olivier 1996–1997.

13 van Alfen 1996–1997, Zurbach 2006.

14 E.g. Catling *et al.* 1980: 91 compare the *i-ru* group to Attic 'nonsense' inscriptions, although this is retracted in TSJ: 101; cf. Zurbach 2006: 59–63. (For lists of the ISJs belonging to each 'group' referred to in the text, see **Appendix A.**)

In **Section 1**, I shall examine the extent to which the palaeography of the ISJs differs from that of the Linear B tablets, and discuss how far this can be used as evidence in the controversial question of the painters' literacy. I shall show that, although a minority of inscriptions display evidence for probable illiteracy, from a methodological point of view it is better to speak of the inscriptions' legibility and potential communicative value; only a small minority of ISJs are likely not to have had such a communicative value.

In **Section 2**, I shall use the evidence from the ISJs' find-spots and from the structure and content of the inscriptions themselves to show that their primary function was administrative, and that mainland finds represent a secondary use in the Cretan–mainland oil trade.

In **Section 3**, I shall discuss the problem of the exact nature of this administrative function – whether the individuals named on the ISJs are potters or oil producers – and the extent to which scientific analysis and palaeography can contribute to this ongoing debate.

## Section 1: Palaeography, Literacy, and Communication

Although the issue of the ISJ painters' literacy is frequently mentioned, it rarely receives detailed attention; the tendency has been to discuss a few ISJs as particularly 'good' or 'bad' Linear B, and to conclude from these that a given painter was or was not literate, with little comprehensive overview.<sup>15</sup> Moreover, statements about literacy and illiteracy are often extremely subjective.<sup>16</sup> A more comprehensive approach to this question can only be undertaken by way of a systematic study of ISJ palaeography as a whole in comparison to tablet palaeography, in order to give a more secure basis for identifying the significance of differences between the two.

However, the very idea of studying 'literacy' in this context is also problematic. Scholars have tended to see an opposition between 'full' (scribal) literacy and complete illiteracy; but clearly there could have existed a whole spectrum of 'literacy' between these two extremes, with people possessing varying levels

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<sup>15</sup> Consani 1980 largely deals with ISJs from different sites separately, while Bennett 1986, Hallager 1987: 172–6, and Killen forthcoming focus on a few groups of vases or particular Linear B signs.

<sup>16</sup> For instance, a 'lack of neatness' in rendering the sign-forms on **MAM Z 1** is cited by Godart–Tzedakis 1992: 187 as evidence of the painter's illiteracy, while Zurbach 2006: 45–6 cites the same feature on **KH Z 23** as proof of a communicative, rather than decorative, function.

of ability to recognise, understand, reproduce, and/or create Linear B signs and inscriptions. In the context of the ISJs, speaking about ‘literacy’ is therefore extremely difficult: how ‘literate’ is a painter who can competently reproduce a three-sign inscription, but has perhaps never painted any other Linear B signs? The question of how far such a painter would have ‘understood’ what they were painting is generally an unanswerable one. As will be seen, some ISJs have features which suggest a misunderstanding of the script’s use, which might point towards the painters being ‘illiterate’; but absence of such evidence for illiteracy is not conclusive evidence for literacy, given the possibility that illiterate painters might have copied models (and might have done so perfectly competently).<sup>17</sup> For that matter, literate as well as illiterate painters could have produced ‘pseudo-inscriptions’, as Immerwahr 2006 shows regarding Attic ‘nonsense’ inscriptions: there is thus no necessary connection between the literacy of the writer and the communicative value of the inscription. What will be discussed hereafter, therefore, is not the painters’ ‘literacy’ but their ‘competence’ at producing legible inscriptions, which is the more important issue for wider questions about the inscriptions’ function(s). Likewise, although I shall discuss in detail the inscriptions whose features may suggest illiteracy/incompetence on the part of their painters, ultimately the question to be asked is whether these features constitute a barrier to legibility and thus to a communicative function.

I shall begin by examining the different types of variation seen on the ISJs, in terms both of sign-forms and of formatting.<sup>18</sup> Owing to space constraints, for each type of variation I shall discuss only a representative example, but the trends discussed have been identified through a palaeographic study of all published ISJs, and each one occurs in a wide range of inscriptions.<sup>19</sup>

Some ISJs appear very close to tablet forms. **EL Z 1** is the ISJ most often cited as being particularly ‘scribal’, largely because of its layout (similar to that of a ‘palm-leaf’ tablet) but also due to the careful arrangement of the signs, which

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<sup>17</sup> de Fidio 1999: 259. Killen forthcoming: 14–18 suggests that the appearance on some ISJs of sign-forms similar to those used by ‘progressive’ scribes (on which see Driessen 2000: 150–1) implies a literate painter using contemporary sign-forms. Quite apart from the controversial issue of Knossian chronology, however, it is presumably possible that such sign-forms could originate from models created by ‘progressive’ scribes.

<sup>18</sup> Discussion of the possible identification of ‘hands’ responsible for groups of inscriptions will be left until **Section 3**.

<sup>19</sup> The majority of ISJs are published in *VIP* and/or *CIV*; **KH Z 16–45** are published in Hallager 2011. References for ISJs published elsewhere are given the first time the ISJ is mentioned in the text. The forthcoming supplement to *CIV* (on which see Sacconi 2012) had not yet appeared at the time of writing.

vary little from tablet forms.<sup>20</sup> Alongside this Bennett 1986: 143 cites **TI Z 30**<sup>21</sup> as the other ISJ closest to the tablet tradition, largely because the inscription has been painted between two lines. Such ruling of lines certainly implies some knowledge of the layout of tablets (or, at least, their appearance), and in the case of **EL Z 1** the painter seems to some extent familiar with the scribal tradition. **TI Z 30** is more difficult, since Döhl 1979's join shows that the first sign is probably a reversed form (see below, pp. 77–8).<sup>22</sup>

That these two ISJs are the only ones to show such line-ruling is not problematic; since most inscriptions contain only a single word, and the other long inscriptions are arranged in a single line around the belly of the jar, one would not expect line-ruling.<sup>23</sup> In terms of sign-forms, many other ISJs are also close to tablet forms, and although not ruled, tend to have their signs neatly aligned: this applies to most of the long inscriptions<sup>24</sup> in addition to many of the single-word inscriptions – among which the shoulder inscriptions often employ the decorative bands as lines marking the base and/or top of the inscription.<sup>25</sup> The long inscriptions also use word-dividers in a way that implies familiarity with scribal practices, apart from **EL Z 1**, **TH Z 839**, and the *a-re-(i-)me-ne* group: while the latter has a divider only before the last word, the first two have dividers both before and after their last word, *wa* and *wa-na-ka-te-ro* – both possibly indicating a desire to mark out the final term as the most important in the inscription, the name of the ‘collector’ or the denotation of ‘royal’ status.<sup>26</sup>

Much of the variation in sign-forms seen on many other ISJs is in fact not significant in terms of legibility. Some odd-looking forms are actually close to less common tablet variants: the form of *mo* on **MY Z 664**, for instance, though it might appear unusual at first, is fairly closely paralleled on tablets:<sup>27</sup>

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<sup>20</sup> Bennett 1986: 143. The unique positioning of a three-term inscription on the shoulder could perhaps also be seen as an indication of ‘scribal’ concern for the ease of reading the inscription; cf. van Alfen 1996–1997: 255–7.

<sup>21</sup> Published in *CIV*, but join subsequently made by Döhl 1979: 66–9.

<sup>22</sup> Melena 1982; see also Killen forthcoming: 16–19.

<sup>23</sup> **TI Z 30** is one of only two certain inscriptions painted on the disc of the false neck (the other being **KH Z 3**).

<sup>24</sup> The *pi-pi* group being perhaps the best example.

<sup>25</sup> In particular the *u-pa-ta-ro* and *a-nu-to* groups.

<sup>26</sup> This positioning of the word-divider on **EL Z 1** could be explained if *da-\*22-to* were the last term in the inscription, but this cannot apply to **TH Z 839** (Duhoux 2011: 86–87). On the ‘collectors’ and *wa-na-ka-te-ro*, see **Section 2**.

<sup>27</sup> Unless otherwise indicated, all images of ISJs and ISJ sign-forms are from *CIV*, and all images of KN sign-forms are from Olivier 1967 (reproduced by kind permission of A. Sacconi and J.-P. Olivier, respectively). Images not to scale. For a more complete range of tablet forms, see the sign-



KN Hand 120:



KN Hand 138:



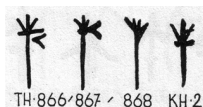
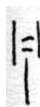
Cf. the more 'standard' form seen in, e.g., KN Hand 119:

Even when sign-forms do vary from those seen on tablets, this is often determined by the medium: ten-centimetre-high signs painted with a brush on the curving side of a jar will naturally be different from centimetre-high signs incised with a stylus on a tablet. Three features particularly characteristic of ISJ palaeography are:

1) elongated sign-forms, such as those on **TH Z 839** and the *a-re-(i-)me-ne* group. Compare, for instance, the form of *a* on **TH Z 849**, or all the ISJ forms of *i*, with typical tablet forms:



KN Hand 104:



KN Hand 104:



2) a tendency towards replacing several short strokes on a tablet with long, curving strokes, more suited to a brush.<sup>28</sup> This is well-illustrated by the *no* on **TI Z 7**, compared to tablet forms; cf. also *mo* on **MY Z 664** above.



KN Hand 107:



tables in Olivier 1967, Sacconi 1974b, Palaima 1988, and Driessen 2000.

<sup>28</sup> Hallager 1987: 176.

3) a tendency to use the most elaborate forms seen on tablets,<sup>29</sup> or even to elaborate the signs further – a feature allowed by the larger size of the signs, and perhaps encouraged by the painters' inclinations towards decoration. For instance, the  $pu_2$  ( $\Psi$ ) on **EL Z 1** has three or four cross-strokes on each of its verticals, where tablet forms normally have only two or three; the  $tu$  on **TH Z 877** is comparable to the most elaborate tablet forms:



KN Hand 141:



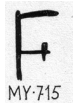
None of these features, however, is a universal rule. In particular, although elaboration is very common, the simplification or linearization of sign-forms is perhaps equally so: the form of  $tu$  on **TH Z 964** contrasts sharply with the above (cf. simplified tablet forms):



KN Hand 103:



Compare also the square form of  $u$  on **MY Z 715** and **717**<sup>30</sup> – for which there are also tablet parallels:<sup>31</sup>

MY Hand 59:<sup>32</sup>

Such simplification of sign-forms is common on tablets, and neither this nor any of the features listed above constitutes a serious barrier to legibility.

<sup>29</sup> Cf. Killen forthcoming: 5–9 on the frequent correspondences of ISJ sign-forms to those of the 'conservative' Knossos scribes.

<sup>30</sup> Georgiev 1976, Melena 1977.

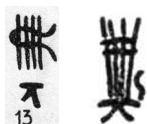
<sup>31</sup> Zurbach 2006: 28 sees this as a local variant, proof that mainland-produced ISJs were not merely imitations of Cretan productions. However, the latest analyses have shown these to be Cretan, like (almost) all ISJs (see *TSJ*, pp. 92–96 and Table 27). A similar form of  $u$  is also seen on KN DI 471.2.

<sup>32</sup> Image from sign-table for Hand 59 in Sacconi 1974b (reproduced by kind permission of A. Sacconi).

More difficult to judge are the sign-forms unique to a single group of ISJs: for instance, the *de* of the **ta-(\*22-)de-so** group; the *no* of the **no-di-zo** group or of **MA Z 2**; and the forms of *ku* of the **ku-ru-zo** and **kü-ja-ni** groups.



The *de* (<sup>M</sup>X) is probably the least problematic of these, since the small curves replacing the usual strokes at the top seem similar to the characteristic of replacing several short strokes with a single curve. Since the basic form of the sign is preserved, this is easily legible.<sup>33</sup>

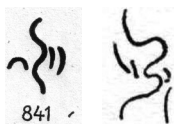


The **no-di-zo** form of *no* (e.g. **TI Z 13**, left) is clearly related to the double-barred form sometimes seen in KN Hands 103 (right) and 117, but somehow the ‘thumb’ has become combined with the bars; the number of times this form is used shows that it is not a ‘mistake’, and it is certainly not illegible.<sup>34</sup>



The **MA Z 2**<sup>35</sup> form of *no* was surely produced under the influence of forms like the above; clearly the painter became confused between the verticals and the cross-bars, but it is less clear whether this is a lapse on the part of an otherwise competent painter (Driessen–Farnoux 1991: 82–4),<sup>36</sup> or a sign of incompetence (Olivier 1996–1997: 282). Either way, the reading of this inscription is not seriously impeded.

The two different forms of *ku* seem to be part of the trend towards simplification. The basic elements are present – a more-or-less vertical, curved central element, with small strokes at each side – but the two forms look unlike each other or any tablet form.<sup>37</sup>



I am inclined to interpret the **ku-ru-zo** form as the product of a competent painter simplifying the sign, since in its basic structure it is not too far from the form seen in, e.g., KH Hand 104 (right),<sup>38</sup> although the central curve has been reversed; it has been consistently produced across at least four jars; and there are no significant difficulties with the *ru* and *zo*.

<sup>33</sup> Hallager 1987: 175 sees this as reflecting ‘a personal style of handwriting’.

<sup>34</sup> For further discussion of this group, see p. 79.

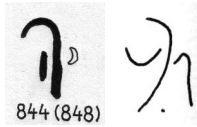
<sup>35</sup> Driessen–Farnoux 1991: 82–3. Image reproduced by kind permission of J. Driessen.

<sup>36</sup> An example of acceptable vertical/horizontal variation on tablets is provided by *di*, whose three verticals are replaced by horizontals by, e.g., PY Hand 1.

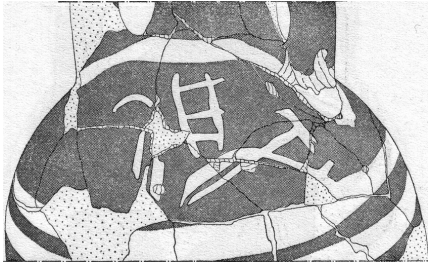
<sup>37</sup> Hallager 1987: 175–6.

<sup>38</sup> Killen forthcoming: 4.

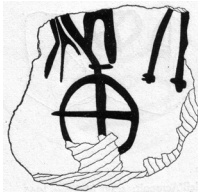




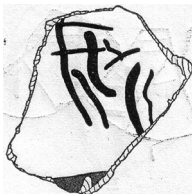
The *ku-ja-ni* form is further even from the sign's most simplified version (as seen in, e.g., KN Hand 133 – right) and so harder to recognise (hence the uncertain reading). This alone might not be certainly significant, but this group also shows an oddly-positioned *ni* ( $\text{X}^{\text{X}}$ ):



**TH Z 844**



The combination of these features suggests a painter unfamiliar with both the formation of certain signs and the arrangement of the elements of an inscription. Compare **MY Z 713**, whose 'ligatured' form is unlikely to be a 'real' ligature (given the lack of ideograms on the ISJs, and the presence of another sign following the *na*);<sup>39</sup> like the sideways *ni*, this seems to indicate a lack of familiarity (or a lack of concern) with the proper layout of inscriptions.<sup>40</sup>



Similarly, **TH Z 966** appears to be the product of a painter unfamiliar or unconcerned with even the proper arrangement of the components of a single sign, or how to separate one sign from the next; *CIV*: 165 is uncertain whether this is actually Linear B. In addition, if the second sign is *wo*, this would be a reversed form.

Reversed signs occur on several ISJs, including **TH Z 839** (reversed *jo*  $\overline{\text{7}}$ ), **TI Z 27** (reversed *we*  $\text{7}$ ), and **TI Z 30** (reversed *qi*  $\overline{\text{7}}$ ). It is difficult to know how much significance to give these, as such reversals are not unknown on tablets – perhaps

<sup>39</sup> Duhoux 2011: 48, n. 6.

<sup>40</sup> Of the ISJs previously identified as of mainland origin, this is one of the few to which *TSJ* (p. 94 and Table 27 s.v. **MYC03**) still assigns a possible mainland origin: chemically it is CC/B but closer to the Boeotian end of the spectrum. However, since no ISJs are demonstrably of mainland origin, and since **MY Z 717** also lies towards the Boeotian end of this chemical group, but is shown to be Cretan by its typology and palaeographic associations, I regard **MY Z 713** as also probably Cretan.

influenced by the few signs (\*34, CYP/ΠΥC, v, and q) which have reversed forms as regular variants, scribes occasionally reverse other signs (e.g. *pu* on MY Go 610.4 and PY An 39.1,<sup>41</sup> or KN Hand 133's *do*<sup>42</sup>).



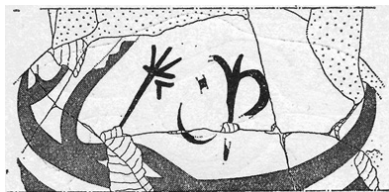
TI Z 27 (detail)



TH Z 839 (detail)

In the case of **TI Z 27**, the lack of space left by the decoration could be a motivation for this reversal – it would seem natural to want to start the sign in the clear lower space – while on **TH Z 839** the stem of the *jo* appears to have been reversed in order to fit the word-divider in.

More clearly significant is the *i-ru* group's combination of a reversed sign *and* a reversed order of signs: while **TH Z 866** and **867** both read *i-ru*, **TH Z 868** reads *ru-i*, with an apparently sinistroverse direction of reading.




TH Z 866



TH Z 867



TH Z 868

Given the lack of other examples of sinistroverse Linear B, the apparent confusion about the positioning of the flourish on the *i*,<sup>43</sup> and the unique form of *ru* (evidently influenced by the decoration: the more usual form is )<sup>44</sup>, these seem to be clear examples of 'incompetent' inscriptions.

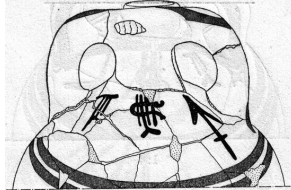
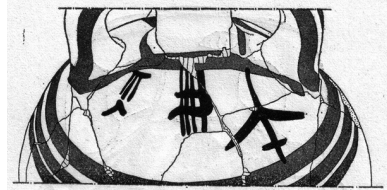
<sup>41</sup> Palaima 1981: 80.

<sup>42</sup> See Olivier 1967: Table XXXIV.

<sup>43</sup> Particularly on **868**, where the flourish appears on the left-hand side of the *i* (as if the sign were reversed) but faces the same direction as those on the other jars, and moreover appears to be attached to the *ru* (Bennett 1986: 142).

<sup>44</sup> TSJ: 101.

**TH Z 857** and **858** show a similar combination of sign-reversals, the reversed order of two signs, and the transposition of elements from one sign to the other: these two jars read *di-no-zo*, but the similarity of both the word and the palaeography (in particular the *no* – p. 76) make it very likely that these belong to the *no-di-zo* group (cf. **TI Z 11**).<sup>45</sup>

**TI Z 11****TH Z 857****TH Z 858**

The form of *di* on both *di-no-zo* jars recalls that of *no* both in the shape of the base and in the length of the verticals; on **857** the *no* and *zo* are fairly normal, apart from the lack of a horizontal in the base of the *no* (the larger size of the *zo* is perhaps paralleled on **TI Z 11**),<sup>46</sup> but on **858** the *no* lacks a base altogether and its curve faces the wrong way, while the ‘head’ of the *zo* is oddly positioned and out of proportion. Again, this combination of mistakes shows these to be ‘incompetent’ inscriptions; the question of whether they and the *i-ru* group are therefore ‘illegible’ will be addressed below.<sup>47</sup>

This brings us to the most problematic type of inscriptions: those which include non-Linear B signs. There are two main ISJs which may have this status: **OR Z 1** and **TH Z 847**.<sup>48</sup> The former has three recognisable, if badly-written, Linear B signs (𐀀 𐀃 𐀆 *ti-sa-ri-*), followed by a group of shapes bearing no resemblance to any known Linear B sign.<sup>49</sup>

<sup>45</sup> Bennett 1986: 137–39.

<sup>46</sup> I assume, with Bennett and *CIV*: 195, that the *zo*’s stem originally continued further down; *CIV* pl. XII shows damage to this area.

<sup>47</sup> On these groups see further pp. 100–1.

<sup>48</sup> *VIP*: 167–8 reads **TI Z 9** as *a?-X-X-ti?*, containing two non-Linear B signs, but I follow *CIV*: 85’s reading *a-ma-ti*; **TH Z 855** contains an unidentifiable sign, but due to damage it is impossible to say whether this is non-Linear B, or merely an unusual form (*VIP*: 79 suggests *no*).

<sup>49</sup> These might be thought to resemble an ideogram plus numeral in format (Zurbach 2006: 22–23); but given that ISJs never feature ideograms or numerals, I cannot see any motivation for such an imitation, even assuming that an ISJ painter could be sufficiently familiar with tablets to imitate these features.

**OR Z 1**

On **TH Z 847**, the first and last signs are again poorly written but recognisable as *e*  $\text{A}$  and *ra*  $\text{O}$ ; the shapes in the middle are more difficult to interpret.

**TH Z 847**

*VIP*: 82 reads this as two non-Linear B signs, *e-X-X-ra*; *CIV*: 129 reads it as a single sign, *e-[.] -ra*. Now, however, Sacconi 2012: 127 reads this sign as \*83  $\text{A}$ ; accepting this new reading would radically alter the status of this inscription.

It certainly seems possible that the form is related to \*83: the vertical rectangle and chevrons are similar to the middle and ‘legs’ of some Knossian forms of this sign (e.g. those of *KN Hands* 117 and 118, below left), while the triangular form



could perhaps be compared to the ‘arrow’ shapes found at the top of the sign. But no tablet version of \*83 has these elements arranged as they are on **TH Z 847**, where they are misaligned and disproportionate, and do not form a coherent sign-shape.



If this is a version of \*83, it seems to be a misremembered one: compare the inscribed bowl **KN Z 1715** (left), whose first sign resembles a cross between a *wa* and a *ja*, while the second (originally assigned the number \*89, but not now regarded as genuine Linear B) somewhat resembles the right-hand half of \*65  $\text{A}$  (*VIP*: 189), or an upside-down *ma*  $\text{A}$  (Thompson forthcoming: 1), or even the weight-sign *L*  $\text{A}$ .<sup>50</sup> In the same way as these two signs, despite their possible influences from real Linear B signs, are regarded as pseudo-signs and transcribed accordingly, I

<sup>50</sup> Pluta 2011: 102 suggests that ‘the unique sign \*89 may indicate a non-Greek personal name’. This hardly seems plausible since there is no other evidence for \*89 being a real syllabogram, nor would this account for the form of the first sign.

regard the sign on **TH Z 847** as a pseudo-sign – perhaps influenced by the form of \*83, but unlikely to have been read as this sign even by a literate Mycenaean. I thus follow the reading of *CIV*, *e*[-.]-*ra*.

Around seven ISJs or ISJ groups (perhaps 12 jars in total) thus have inscriptions which display significant palaeographic difficulties, such as might suggest that their painter was not fully competent at producing legible inscriptions, and/or that producing a legible inscription was not in fact the intention. This is larger than the number of ISJs whose painters can be said to be familiar with ‘scribal’ Linear B – perhaps only **EL Z 1** – but is nonetheless a very small number when compared to the total of c. 120 ISJs. On the basis of palaeography, there is thus no good reason to see the painters of the vast majority of the ISJs – c. 90% – as any less than fully competent at producing inscriptions, nor the inscriptions themselves as any less than fully legible; it therefore seems best to posit a communicative function as the primary reason for their creation.

How, then, are we to explain the few ‘incompetent’ ISJs – could they in fact have had an equally communicative function? Citing the care generally taken to ensure the visibility of inscriptions (through prominent positioning, especially on the shoulder of the jar, and/or the signs’ large size), van Alfen 1996–1997: 255–59 argues that *all* the ISJs were communicative; he compares the inscriptions containing apparently illegible elements to doctors’ handwriting on prescriptions – illegible to an outsider, but perfectly comprehensible to a person within the system. To some extent this analogy might be applicable (regarding the recipient, at least) to ISJs such as **TH Z 966** (if this were regarded as a ‘messy’ inscription but one in which the shape of the signs can still be made out) and even to **TH Z 868** and the *di-no-zo* jars (assuming that a limited number of names are likely to appear on ISJs, a reader familiar with the names *i-ru* and *no-di-zo* could work out that these were intended, as we can). But I cannot see how this could apply to **TH Z 847** and **OR Z 1**, which are not merely ‘messy’ or ‘difficult to read’, but actually contain non-Linear B signs. It seems that these two ISJs, at least, are ‘pseudo-inscriptions’, presumably produced because some decorative and/or prestige value was attached to such inscriptions.<sup>51</sup> Many of the other ISJs, at both ends of the scale of legibility, also display an aesthetic concern – e.g. the careful painting of **TH Z 839**, or the influence of the jar’s decoration on the *i-ru* group’s *ru* (p. 78).

But a concern for aesthetics and a concern for legibility are not incompatible; indeed a carefully-painted inscription like **TH Z 839** is easier to read as well as more aesthetically pleasing. Moreover, certain inscriptions which have clearly *not* been planned as part of the jar’s decoration suggest that communication was

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<sup>51</sup> Zurbach 2006: 61–63; see further p. 92–3.

prioritised over aesthetics: **TI Z 9** is probably the best example, as the inscription has been squeezed into the largest available space on the shoulder with little concern for appearance.<sup>52</sup> On the other hand, **KH Z 3** is particularly neatly painted, but its position on the disc of the false neck makes it unlikely that it was seen as adding decoration to the jar. Even some of the ‘incompetent’ inscriptions show little concern for aesthetics – the painters of **TH Z 966** and the *di-no-zo* jars do not seem to have taken particular care over the signs’ arrangement, though the question of whether this therefore implies an attempt to create a communicative inscription must be left open.<sup>53</sup>

It may at this point be worth a brief consideration of the ten non-SJ painted inscriptions.<sup>54</sup> These range from a single sign (not certainly identifiable as Linear B, and probably functioning as a ‘potmark’) on the base of a skyphos (**TI Z 52**), to the MN *pi-ra-ki*, painted on the side of a bowl (**MY Z 712**, which appears to be of local production [TSJ: 95]). That this – the only complete and identifiable term on any of these inscriptions – is an MN suggests a possible function of marking ownership; the majority of the other inscriptions are in a similar position to **MY Z 712** and could conceivably also be PNs. However, the existence of the pseudo-inscription **KN Z 1715** (p. 80) suggests that these are not simply functioning as ‘labels’, but also, as Pluta 2011: 105–7 argues, conveying a certain degree of prestige.<sup>55</sup> Note also the possible decorative value of some of these inscriptions – both **KN Z 1715** and **KH Z 25**, for instance, have particularly neatly-painted signs, carefully arranged within the other decoration (although others, such as **KH Z 23**, are much less neat). Even amongst this small group of inscriptions, therefore, we

<sup>52</sup> van Alfen 1996–1997: 257.

<sup>53</sup> I am inclined to see the *di-no-zo* jars, at least, as probably communicative in intention, since other members of this group appear perfectly competent and legible.

<sup>54</sup> **KH Z 23, 24, 25; KN Z 1715; MY Z 207, 712, 716; TI Z 28, 49, 52**. Cf. also the examples of Linear B incised on pottery: **KH Z 16** (SJ), **PY Za 1392** (coarse-ware pot, PTT), **DIM Z 2** (kylix sherd, Adrimi-Sismani–Godart 2005) and a possible inscription from Amnisos (SJ handle, Schäfer 1992: 190 and pl. 52.2–3). Discussion of the very few (possible) inscriptions on other materials is beyond the scope of this paper; see Palaima 2002–2003 and Pluta 2011: 112–19.

<sup>55</sup> Hallager–Tzedakis 1983: 72–3 argue against a prestige function on the grounds of the small numbers of these inscriptions, and suggest that **KH Z 23–5**, found in a rubbish dump alongside material from a shrine, may have had some kind of cultic function; cf. the incised sherd **DIM Z 2**, found in a possible shrine (Adrimi-Sismani–Godart 2005: 50). However, we have no way of knowing whether the original purpose of the inscriptions relates to their find-spot, particularly in the case of the KH bowls, whose inscriptions were painted pre-firing. As Pluta 2011: 103–6 points out, the small numbers are equally problematic for a cultic interpretation, but might be expected for elite prestige items, given the small number of people who would have been able to read them.

seem to have a range of possible functions, including both communication (of ownership) and a decorative/prestige function.

This section has shown that the primary purpose of the vast majority of these inscriptions is most likely to have been communicative: whether or not an inscription's painter could read/understand what they were painting, it was certainly intended that its recipient should be able to. The 'pseudo-inscriptions', and comparison with the non-SJ painted inscriptions, show that there was probably an element of decorative/prestige value attached to the inscriptions, but their small number relative to the legible ISJs shows that this was limited, and secondary to the purpose of communication. In the next section I shall discuss the identity of the intended recipients of this communication, which will help to establish both the function of the inscriptions and the potential reasons for their acquisition of any such prestige value.

## Section 2: Gift-Exchange or Administration?

Having demonstrated that the ISJs were generally intended to be read, the question is, who was meant to read them? Two main theories are current regarding the intended recipients of the ISJs: that they would be used by Cretan officials as part of their administrative system,<sup>56</sup> or that they were aimed at members of the mainland palatial elites, who participated in a system of gift-exchange with Cretan elites.<sup>57</sup> Either theory is compatible with the evidence that the inscriptions were primarily communicative; the evidence which suggests an additional decorative function in some cases would be harder to explain in administrative terms, but would fit with the conception of the ISJs as prestigious gifts. Since this evidence is so limited, however, it is necessary to look beyond palaeography in order to evaluate these theories.

Some of the most important evidence naturally comes from the inscriptions themselves, in particular from their structure. The longest ISJs display a formula with the structure PN (nom.) + TN + **PN (gen.)**:<sup>58</sup>

**TH Z 853:** e-u-da-mo , wa-to , **ri-\***82-ta-o ('Eudāmos, at wa-to, of ri-\*82-tās')

<sup>56</sup> Olivier 1996–1997; van Alfen 1996–1997.

<sup>57</sup> Duhoux 2011; Driessen *et al.* forthcoming.

<sup>58</sup> The TN may be replaced by an ethnic, e.g. *o-du-ru-wi-jo* (TN: *\*o-du-ru*) on **TH Z 839**. For texts of all longer ISJs, see **Appendix B**.



This is generally agreed to be parallel to a formula seen in the KN D-series of sheep tablets:<sup>59</sup>

**KN Da 1135.A**                      **u-ta-jo-jo**              OVIS<sup>m</sup> 100  
    .B ke-to , / \*56-ko-we ,  
 ('*Ke-to*, at \*56-ko-we, of *u-ta-ios*: 100 male sheep')<sup>60</sup>

In the case of the KN tablets, this indicates the name of the 'shepherd' in charge of the flock, the place the flock is located, and the name of a higher-status individual, the 'collector'. Although the precise status of these 'shepherds' and 'collectors' is debated,<sup>61</sup> what is important here is that the 'collectors' act as intermediaries between the palace and workers lower down the hierarchy, and are responsible for the delivery of the workers' products to the palace. Similarly, on the ISJs this structure presumably represents the 'producer' (of the jar or its contents – see **Section 3**), the place of production, and the 'collector' in overall charge of this production.

A few of the longer ISJs deviate from the above pattern in having, instead of the name of a 'collector', the adjective *wa-na-ka-te-ro* (*wanakteros* 'royal') or its abbreviation *wa*.<sup>62</sup> Here, the *wanax* (king) is in the same position relative to the 'producer' as the 'collectors' are on the other longer ISJs. It is debated, however, exactly how these two categories of ISJ relate to the most common form, that with only a single PN.<sup>63</sup> The second version of the formula in the KN D-series, containing only a single PN and TN, indicates 'shepherds'/flocks under direct palatial control, as opposed to those with a 'collector' as intermediary. Bennet 1992: 91 regards both the *wa(na-ka-te-ro)* and the single-PN ISJs as parallel to this formula indicating palatial control, and suggests that the explicit marking of *wa-na-ka-te-ro* on certain ISJs is due to their production at a distance from the palace, where a higher proportion of produce might be under the control of the 'collectors'. Conversely, van Alfen 1996–1997: 260–4 sees the single-PN inscriptions as abbreviations of the full 'collector' formula (as occurs on tablets, depending on

<sup>59</sup> First noted by Hart 1965: 19.

<sup>60</sup> Although the precise phonetic interpretation of most of these terms is unknown, contextual information in these and other records shows them to be PNs and TNs.

<sup>61</sup> For a range of opinions, see, e.g., Bennet 1992, Carlier 1992, Driessen 1992, and Godart 1992.

<sup>62</sup> **EL Z 1**, **TH Z 839**, **TI Z 29**, **KH Z 43** (**Appendix B**). In addition, **KH Z 16** has the single sign *wa*, possibly standing for *wa-na-ka-te-ro*, incised on the disc of the false neck, but due to its unique status the function of this is not certain.

<sup>63</sup> **TI Z 27** is the only ISJ with a TN (\*56-ko-we) but no PN (*TSJ*: 103 refers to an unpublished ISJ from Knossos with this same inscription).



the amount of information required at different recording levels), implying that most ‘producers’ were controlled by ‘collectors’; while Zurbach 2006: 56–7 and Duhoux 2011: 76–7 see a three-way distinction between ‘producers’ under regular palatial control designated only by their PNs (the single-PN ISJs being parallel to the PN+TN tablets), those controlled by ‘collectors’, and those working for the personal benefit of the *wanax*. This is perhaps the most plausible explanation, since it best parallels the situation seen in the tablets (whereby the majority of the ‘producers’ are palatially-controlled and a minority ‘collector’-controlled).<sup>64</sup> However, the small number of relevant inscriptions mean that it is hard to be sure whether features such as the lack of examples of *wa(-na-ka-te-ro)* and ‘collector’ ISJs certainly from the same location, or the (very rough) correlation between the proportions of different categories of ‘producers’ on the KN D-series and the ISJs (Duhoux 2011: 77), are significant. What is most important is that the ISJs at least distinguish between directly-controlled and ‘collector’-controlled production, just as in the KN D-series, and that the *wa(-na-ka-te-ro)* ISJs in particular demonstrate a link to a central palatial authority.<sup>65</sup>

These close parallels to a formula regularly used in Knossian administrative records thus show a similar hierarchical structure of control over the production of SJs and/or the oil they contained to that seen in the management of sheep and production of wool. This strongly implies that the ISJs were, likewise, administrative objects, whose production and use is to be understood within an administrative system monitoring the production/delivery of goods similar to that represented by the Knossos tablets (whether or not this was controlled by the palace at Knossos).<sup>66</sup> However, several difficulties with this theory present themselves:

- The small number of ISJs, particularly of those with longer inscriptions: are c. 120 inscriptions, of which only 14 certainly displayed more than a single

<sup>64</sup> Parallels for designating workers as *wa-na-ka-te-ro* are not found at KN, but there are three described in this way at PY: a ‘royal potter’ (*ke-ra-me-wo*, *wa-na-ka-te-ro* [PY Eo 371.A]), ‘royal fuller’ (*ka-na-pe-u*, *wa-na-ka-te-ro* [PY En 74.3]), and perhaps a ‘royal armourer’ (*e-te-do-mo*, *wa-na-ka-te-ro* [PY En 609.5]). There is also one probable example of a group of ‘royal textile-workers’ on TH Of 36.1 (*a-ke-ti-ra<sub>2</sub>*, *wa-na-ka[-te-ra]*). (Texts: PTT, AGS<sup>2</sup>; see also DMic q. vv.).

<sup>65</sup> de Fidio 1999: 266 suggests that the single-PN ISJs were privately produced, but unless they are assumed to be ‘trademarks’ (a theory de Fidio rejects, in my view rightly [p. 89]) it is hard to see what function these could have had in private trade; it seems better to assume that all ISJs belonged to the palatial sphere.

<sup>66</sup> There is tablet evidence for at least one ‘collector’ at Knossos involved in the production of perfumed oil (Killen 1995: 215ff.).

word, enough to represent an administrative process dealing with what we know to have been a large-scale industry?<sup>67</sup>

- The possible element of decorative value to the inscriptions: how could jars like **TH Z 847** and **OR Z 1** form part of an administrative process?
- The distribution of ISJ find-spots: c. 80% of published ISJs were found on the Greek mainland, and only c. 20% on Crete, while only three of the mainland finds, and seven overall, were not found in contexts with attested administrative use of Linear B.<sup>68</sup> Most strikingly, no certain ISJ has yet been found outside of Crete and the Greek mainland:<sup>69</sup> this contrasts sharply with the wide distribution of LM III Cretan SJs, which have been found across the central and eastern Mediterranean (including the Dodecanese, the southern coast of Asia Minor, Cyprus, the Levant, Sicily, and Sardinia).<sup>70</sup>
- The fact that the inscriptions were painted before firing – this implies an intention of permanence which might seem at odds with the temporary nature of the Linear B tablet archives.<sup>71</sup> Driessen *et al.* forthcoming: 8 take this to suggest that ‘they [the inscriptions] are the reason for producing the vase rather than the contents’.

<sup>67</sup> Duhoux 2011: 51–52 contrasts this with the 1,800 SJs listed on KN K 700 alone. In fact, a (necessarily very rough) count of the *total* number of SJs and ISJs reported from the whole Mediterranean only gives around half the number on this one tablet (based on *TSJ*: 133–58). However, the ratio of ISJs to SJs is certainly skewed in favour of the former (these being more likely to be reported), so the actual ratio must have been small (*TSJ*: 1).

<sup>68</sup> Mainland: **OR Z 1**, **KR Z 1**, **EL Z 1**; Crete: **AR Z 1**, **MA Z 1–2**, **MAM Z 1** (AR and MA ISJs: Demakopoulou 1988: 208; Driessen–Farnoux 1991: 78–83). This number will, however, be increased by the as-yet unpublished finds **MA Z 3–7** and **PRI Z 1** (Sacconi 2012: 126; for **MA Z 3–4**, see Driessen *et al.* forthcoming). I do not include the supposed ISJs from Gla (Iakovidis 1989 pl. 3; Iakovidis 2001: 102) and the Spartan Menelaion (Catling 2009: 287–92, fig. 323, pl. 127d): I do not regard the former as an inscription (cf. Zurbach 2006: 24–6 and Sacconi 2012: 124), while there is too little of the latter preserved for it to be securely identified as an ISJ.

<sup>69</sup> A find of an ISJ from Sidon, Lebanon, has been reported in a preliminary publication by V. Karageorghis in Doumet-Serhal *et al.* 2008: 32–3. This includes a drawing of a sign which could be compatible with Linear B \*22, but the relevant part of the jar is apparently not shown in the accompanying photograph. Until full publication makes a proper evaluation possible, I therefore follow del Frio 2012: 21 in viewing this as a possible rather than certain ISJ.

<sup>70</sup> Based on *TSJ*: 153–8 (list of reported LM/LH III SJs) and Table 27 (suggested origins of analysed SJs).

<sup>71</sup> Tablets appear generally to have been kept for only a single year (Killen 2008: 162); long-term recording on perishable materials remains a possibility (Palaima 2011: 116), but one for which naturally there is no direct evidence. Compare also sealings, which, once their information had been transferred to tablets, would presumably have been discarded (Palaima 2000: 227).

All this strongly suggests that the inscriptions may have been aimed at recipients on the mainland. Moreover, in the Theban Kadmeion, around 50 ISJs were found in a single corridor (Corridor Δ),<sup>72</sup> which might suggest that they were deliberately collected and stored as valued items; compare the two finds of ISJs in tombs (**AR Z 1**, **TI Z 9**) and the apparent preservation of **EL Z 1** (dated stylistically to LM IIIB but found in an LH IIIC context) for three generations before its deposition, which could suggest a similar prestige value.<sup>73</sup>

Duhoux 2011 therefore suggests that the ISJs formed part of a system of gift-exchange between Cretan and mainland elites, the inscriptions being used to mark particularly valuable/prestigious gifts. The limited numbers of ISJs, and the apparently decorative function of some, are thus explained by their high prestige – in order to preserve the rarity value of such a gift, the number produced would have been small; once such a value came to be attached to inscriptions it would not be surprising if imitation inscriptions began to be produced.<sup>74</sup> Naturally, if the ISJs were specifically intended for areas of the Greek mainland where literate members of the palatial elite would be able to read them, the distribution discussed above would be equally unsurprising.

A closer examination of the mainland archaeological contexts of the ISJs, however, shows that the situation is more complicated than this. At Mycenae, there is no large deposit of ISJs comparable to that found at Thebes – the jars were found in various places across the site, with no more than two being found in the same location,<sup>75</sup> and in at least two cases a single ISJ was found amongst a large deposit of uninscribed SJs (**MY Z 206**, in the House of the Columns on the citadel, and **MY Z 718**, in Petsas House).<sup>76</sup> Moreover, at Thebes, around 50 other SJs were found in Corridor Δ of the Kadmeion alone – in total more than 120 SJs (including ISJs) were found in this and the adjoining corridors and nearby rooms.<sup>77</sup> Admittedly, this is a remarkably high proportion of inscribed to uninscribed jars, which may well demonstrate some kind of preference for the inscribed variety; but this preference does not seem to have been strong enough to merit treating the ISJs differently from the uninscribed SJs.<sup>78</sup> At neither Mycenae nor Thebes, then, can

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<sup>72</sup> CIV: 53.

<sup>73</sup> Duhoux 2011: 60, 71. Although fine-ware SJs are often found as burial goods, transport SJs rarely are (Shelmerdine 1985: 145).

<sup>74</sup> Duhoux 2011: 71.

<sup>75</sup> CIV: 27–30; TSJ: 155.

<sup>76</sup> Zurbach 2006: 27, 31–2. **MY Z 718** published in Petrakos 2001: 42.

<sup>77</sup> Zurbach 2006: 19–21; Dakouri-Hild 2001: 86, n. 21 and 87, fig. 3–4.

<sup>78</sup> Pluta 2011: 94 points out that Cretan vessels might already be considered prestige items *qua* imports.

we see a clear distinction between prestigious ISJs and significantly less prestigious SJs.<sup>79</sup>

Moreover, Duhoux offers no explanation for what has been cited as one of the most puzzling aspects of this distribution, the complete lack of any ISJs at Pylos,<sup>80</sup> commenting only that Pylos was apparently isolated from this 'fashion'.<sup>81</sup> To state that no ISJs have been found at Pylos is in a way misleading, since in fact the number of SJs found is extremely small – only seven have been reported (of the five analysed in *TSJ* [Table 27], at most three are Cretan). Although this could be thought to be due to the common problem of under-reporting of SJs (p. 86, n. 67), it fits the general pattern seen at Pylos, whose pottery gives little evidence of contact with Crete or the rest of the mainland, in terms of either imports or stylistic influence.<sup>82</sup> The lack of ISJs is thus part of the broader question of Pylos' ceramic isolation – which is all the more puzzling given the evidence for Pylian production and probable exportation of perfumed oil.<sup>83</sup> Haskell 1984: 104–7 offers two explanations for this, suggesting that Pylos may have been involved only indirectly in overseas trade, via the Argolid; alternatively, or additionally, the chronology of Pylos' final destruction may be important. This destruction – which, naturally, forms the layer from which our evidence comes – is dated to LH IIIB2–IIIC Early: slightly later than the period from which most ISJs and SJs date (LM IIIA2–III B1).<sup>84</sup> Thus it is possible that evidence of greater contacts during the period from which most of our evidence for the Mycenaean oil trade comes is to be found either in earlier layers of the palace itself, or in earlier oil workshops potentially located outside the palace. This is unprovable without further excavation, but both of these explanations assume that the ISJs were functionally equivalent to the SJs in a mainland context; indeed, unless this assumption is made, it

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<sup>79</sup> The situation at Tiryns is more difficult to assess, as most of the ISJs were found in the earliest excavations of the citadel (Zurbach 2006: 33). *TSJ*: 156 lists six SJs found in the Unterburg but none from the citadel. Coarse-ware SJs are notoriously prone to under-reporting (p. 86, n. 67), and Zurbach 2006: 36 reports a remark by the excavator that SJs were found alongside the ISJs. Note also that the Unterburg yielded two ISJs (*TSJ*: 156). The initial apparent distinction between ISJs on the citadel and SJs in the Unterburg thus seems to be an illusion.

<sup>80</sup> van Alfen 2008: 236.

<sup>81</sup> Duhoux 2011: 85.

<sup>82</sup> Blegen–Rawson 1966: 353; Shelmerdine 1985: 148.

<sup>83</sup> Shelmerdine 1985. Zurbach 2006: 51 argues that the absence of the *practice* of inscribing vases is significant, but this is based on the assumption that some ISJs are of mainland production, for which the latest analyses show there is no good evidence (p. 77, n. 40): only the inscribed bowl **MY Z 712** can be said with some confidence to be of mainland origin (*TSJ*: 94–5).

<sup>84</sup> **MI Z 4** (Demakopoulou–Divari-Valakou 1994–1995: 326–7; pl. II) appears to be the only ISJ dated to approximately the same period as the destruction of Pylos (Driessen 2008: 72–5).

is hard to explain why the one palatial centre with no finds of ISJs is also the only one to show hardly any evidence for imported SJs.<sup>85</sup> The similarity of the distribution of inscribed and uninscribed jars, both between and within mainland sites, gives little support for the assumption that the purpose of the inscriptions on the ISJs was to mark them out as significantly more prestigious items.

Moreover, as Zurbach 2006: 53–54 points out, if the ISJs were intended for the mainland, it is difficult to explain the finds on Crete itself, in particular those found in contexts of domestic usage (as many of the KH ISJs were – note particularly **KH Z 5** and **39**, from the *ta-(\*22-)de-so* group, whose other members were found on the mainland), and even in a tomb (**AR Z 1**). Duhoux 2011: 64–65 refers to **KH Z 43**, found deposited in the floor of the ‘Linear B House’, as a possible gift from the *wanax* to one of his entourage, but it is unclear why the same mechanisms of gift-exchange should operate between members of the elite at the same centre as between those at different sites, and the suggestion that it was placed in the floor as an ‘honorific distinction’ to be seen by everyone entering the building (p. 65) seems implausible.<sup>86</sup>

Most fundamentally, the gift-exchange theory offers no good explanation for the *content* of the inscriptions: if members of the Cretan elite wished to enhance their gifts’ prestige, or to create ‘name cards’ for their guest-friends, why would they do so via inscriptions bearing the names of the (presumably low-status) ‘producers’ and their locations, with their own names appearing only in third place – and why do most ISJs bear only the name of the ‘producer’? Unless it is assumed that oil from particular places/producers was more highly valued, such inscriptions make little sense aimed at mainland readers, and this is simply a return to the ‘trademark/ advertisement’ theory, which, in the context of a highly centralised economic system (quite different from a modern market-based economy) and a society with very restricted literacy, appears implausible.<sup>87</sup> Moreover, if the ISJs were so highly valued as being particularly prestigious gifts, why are less than a third of the longer inscriptions explicitly associated with the *wanax* – presum-

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**85** The debate over the nature of Bronze Age Aegean ‘trade’ is beyond the scope of this article (for a variety of views see, e.g., Snodgrass 1991, Cline 1994: 85–8, and de Fidio 1999). Regardless of the way in which their transportation to the mainland is viewed, the ISJs were treated in the same way as the SJs at their destinations.

**86** It is not clear from the excavation report (Andreadaki-Vlasaki–Hallager 2007: 16–20) whether the jar or inscription would even have been visible once the floor was constructed; moreover it is hard to imagine why a prestigious item should be placed in a pit in the floor.

**87** van Alfen 1996–1997: 261–2. Cretan oil does seem to have been particularly valued by mainlanders (p. 87, n. 78); but that a Theban should attach greater value to a jar of oil through knowing that it was produced by Eudamos in *wa-to* seems unlikely.

ably the person most likely to be sending such gifts? If *wa(-na-ka-te-ro)* ISJs were so severely restricted in number because of their extraordinarily high prestige,<sup>88</sup> it seems strange that the sending of similar gifts in larger numbers by the ‘collectors’ would not have been felt to infringe on the prerogatives of the *wanax*; and arguing that inscriptions are a mark of particularly high prestige and yet that most ISJs have only single-term inscriptions due to either the lower value of their contents or the lower status of their donors and/or ‘producers’<sup>89</sup> seems somewhat inconsistent.

Furthermore, it is as difficult to see ISJs like **TI Z 9** or **KH Z 3** as conferring prestige value as it is to see **OR Z 1** and **TH Z 847** as communicative. Although SJs are rarely elaborately decorated, the ISJs are generally among the plainest, rarely having more than a few bands painted around the belly or shoulders – the most elaborate pattern on any ISJ is the double deep wavy line pattern seen on, e.g., **KN Z 1716** (Demakopoulou 1988: 208) and **MI Z 4**. None has an elaborate motif such as the octopus or ‘floral’ patterns seen on some uninscribed SJs (although these motifs are most commonly found on SJs from Central Crete, which has produced relatively few ISJs). Nor, of course, are there any fine-ware ISJs; even the broad typology group D, whose SJs show the most similarity to fine-ware, contains no inscribed jars (*TSJ*: 21–2). None of this suggests a particular prestige value compared to ordinary SJs – and indeed, some ISJs are typologically identical to other uninscribed SJs, distinguished *only* by the inscriptions.<sup>90</sup>

The permanence of the pre-firing inscriptions is also less problematic than is argued by Driessen *et al.* forthcoming. Both ISJs and SJs were regularly decorated before firing; if the necessary content was already known then painting the inscription along with the decoration was only practical,<sup>91</sup> with the added benefit of producing a more durable inscription. Note also that some SJs have potmarks painted pre-firing in similarly prominent positions; some of these marks resemble Linear B signs, but many do not,<sup>92</sup> and it seems better not to regard any of

<sup>88</sup> Duhoux 2011: 82.

<sup>89</sup> Duhoux 2011: 72–3. It is not clear to me who the donors of these single-term ISJs would have been; Duhoux distinguishes the donors from the ‘producers’ (as seems reasonable, since the ‘producers’ would presumably be rather far down the social scale to be giving such gifts), but the gift-exchange theory was based on the donors’ *own* names being on their gifts.

<sup>90</sup> Haskell’s Typegroup IX (*TSJ*: 13–14 = Raison’s ‘groupe de **TH Z 858**’, *VIP*: 101–8) contains both inscribed and uninscribed SJs.

<sup>91</sup> What little evidence there is suggests that the decoration was painted first – see, e.g., the influence of the decorative pattern on the form of *ru* on **TH Z 866-8** (p. 78).

<sup>92</sup> Signs resembling Linear B *ka* are the most common of the former (e.g. **TH Z 860**, *VIP*: 90–91 and pl. LX); for examples of the latter see *VIP*: 91–6 and 151–2. Note that, since the form of *ka* ( $\oplus$ )

these as true inscriptions. Nonetheless, the contrast between these and most other pre-firing marks (painted or incised), which are usually placed in inconspicuous positions,<sup>93</sup> aligns these marks with the ISJ inscriptions and suggests that they also played a wider post-production role than is usually assumed for pre-firing marks<sup>94</sup> – but while isolated marks of this kind could plausibly have played a part in a system of tracking production and/or transportation,<sup>95</sup> they surely could not have functioned as prestige indicators or ‘name cards’ within a gift-exchange system.

The gift-exchange theory thus does not offer an adequate explanation for either the inscriptions themselves or the jars’ distribution, which once again leaves us with the problems set out on pp. 85–6. The simplest explanation for the contents and structure of the inscriptions themselves, and the one which best fits the available evidence, is that they were indeed painted as part of a Cretan administrative process.<sup>96</sup> The simplest explanation for the distribution of the ISJs is that the majority were sent to the mainland as part of the oil trade, in the same way as uninscribed SJs. But these two explanations are not incompatible if one assumes that jars used for the transportation of oil within Crete were subsequently exported – as was presumably the case for the large numbers of Cretan uninscribed jars found on the mainland.<sup>97</sup> Once the inscriptions had fulfilled their original purpose, there would be no need to preserve them as administrative documents, but the jars themselves could still function as containers – the ISJs would now be functionally equivalent to SJs.<sup>98</sup>

The high proportion of ISJs in the Theban Kadmeion suggests that in this secondary context of re-use in trade, some value may have been attached to these

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is a very simple one, the use of this as an isolated mark does not necessarily reveal influence from the Linear B script.

<sup>93</sup> Lindblom 2001: 17. Cf., for instance, **TI Z 52** (p. 82).

<sup>94</sup> Hirschfeld 1999: 267.

<sup>95</sup> Compare the post-firing incised Cypriot potmarks used in the organisation of trade (Hirschfeld 1996, Hirschfeld 2002).

<sup>96</sup> The issue of the ISJs’ small numbers is difficult to address due to our severely skewed data (p. 86, n. 67) but is usually explained as being due to an administrative batch-marking system, whereby an ISJ would serve as a marker for a batch of SJs (Bennet 1992: 80). See further p. 94.

<sup>97</sup> Evidence that jars may have been further reused is provided by two SJs found at Mycenae – one central Cretan, the other of mainland origin – whose stoppers bear the same seal impression (*TSJ*: 125).

<sup>98</sup> Zurbach 2006: 53–5. J. Bennet (pers. comm.) has pointed out that **TH Z 847** was found amongst the other ISJs in the Kadmeion at Thebes: having a ‘pseudo-inscription’ among legible inscriptions was apparently unproblematic, implying that in this context the inscriptions’ content was unimportant.

inscriptions; but the lack of distinction between ISJs and SJs in their find-spots implies that this was not particularly strong compared to the value a Cretan SJ might already possess by virtue of being Cretan.<sup>99</sup> Perhaps, since mainland SJs were probably never inscribed, the inscriptions could have served on the mainland as markers of the jars' Cretan origins.<sup>100</sup> Moreover, the fact that no certain ISJs have been found in the wider Mediterranean strongly suggests that Cretans may have deliberately selected these jars for export to the Greek mainland once their administrative purpose had been fulfilled.<sup>101</sup> Perhaps their value as a marker of Cretan products was known, or perhaps Cretans who knew that Linear B was also used, and Greek spoken, on the mainland, might even have selected these as a marker of identification, a sign to the recipients that the dispatchers of these jars also spoke Greek and wrote Linear B – that they were “people you can do business with”.<sup>102</sup>

The ‘pseudo-inscriptions’ in particular seem to indicate that the outward *appearance* of writing was valued to some extent: this could be connected to the place of writing in Mycenaean society, and the unique mobility and visibility of the ISJs as Linear B inscriptions.<sup>103</sup> Since writing was almost entirely restricted to use by/for the purposes of the central administration, creating or using an ISJ would presumably have implied an association with that administration and its power and status. Gerleigner 2012: 54 argues that ‘nonsense’ inscriptions ‘possess some of the significative power of a text ... by virtue of ... the cultural knowledge people possess with regards to writing’. Although this is in a discussion of Attic ‘nonsense’ inscriptions, the point applies equally to the ISJs: when the majority of people encountering an ISJ (e.g. in the process of transportation) would be unable to read it, but could have been in some way aware of these markings as an expression of central control, ‘pseudo-ISJs’ could have similarly functioned

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<sup>99</sup> p. 87, n. 78; cf. van Alfen 1996–1997: 262.

<sup>100</sup> As, indeed, might certain kinds of decoration characteristic of Cretan SJs, e.g. light-on-dark decoration or deep wavy line/octopus patterns (*TSJ*: 90).

<sup>101</sup> Cf. van Alfen 1996–1997: 272. Compare the specialised export of different pottery types from the Argolid to Rhodes, Cyprus, and the Levant (Sherratt 1982: 182–3, Sherratt 1999: 187–8, Hirschfeld 1996: 297): given such specialised production, the specialised selection of existing pots does not seem surprising.

<sup>102</sup> Of course further finds such as the possible ISJ from Sidon (p. 86, n. 69) may change this picture, but it is worth noting that finds of small numbers of ISJs in non-Greek-speaking areas would still be compatible with the selection of ISJs for export to the mainland; indeed, this might more plausibly be a tendency rather than a universal practice. Alternatively, or additionally, ISJs might have been reused in exports from the Greek mainland to the East. It is, however, hard to see how this could be compatible with the gift-exchange hypothesis.

<sup>103</sup> Pluta 2011: 111.



as visible symbols implying their creator's/user's association with the central administration and its prestige.<sup>104</sup> But again, this would be merely a secondary function; there is no reason to revise the conclusion that the communicative – specifically, administrative – function was primary.

### Section 3: Potters or oil producers?

We have seen that the primary function of the ISJs was an administrative one – but what was the precise nature of this function? Clearly, the inscriptions show that the ‘producer’ has fulfilled his obligations towards the collector or the administrative centre (with the ‘collector’ ISJs potentially functioning equally as evidence of the fulfilment of the collector's own obligations) – but are these ‘producers’ the producers of the oil contained in the jars,<sup>105</sup> or the potters who produced the jars themselves?<sup>106</sup> The former would provide further evidence for the involvement of ‘collectors’ in the oil industry (Killen 1995), while the latter would add significantly to the meagre evidence for central administration of pottery production.<sup>107</sup> Various sources might provide evidence for this question, including the practicalities of a batch-marking system, the ratio of ‘collectors’ to ‘producers’, scientific analysis, and palaeography.

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**104** Zurbach 2006: 61–70 argues for a view of writing in this context as an instrument of power and prestige amongst the elite. This might be true of the non-SJ painted inscriptions, which are mostly fine-ware pottery, and have been found only at administrative centres, so would probably have been owned by members of the elite (see pp. 82–3). The significant differences between these and the ISJs, however, suggest that the former may rather indicate attitudes towards writing at lower levels of society.

**105** This is the more generally favoured hypothesis, e.g. van Alfen 1996–1997; de Fidio 1999; Zurbach 2006.

**106** Olivier 1996–1997. It is generally assumed that the potters also painted the jars (*TSJ*: 97).

**107** Only four potters are mentioned in the tablets (all at Pylos); the few documents listing ceramics reveal little about the process(es) by which palaces obtained pottery (Whitelaw 2001: 71–4). Whitelaw concludes that, at Pylos at least, pottery production was not palatially-administered; cf. Knappett 2001, who argues plausibly that the (limited) textual evidence (particularly the special status of some potters, e.g. PY Eo 371's *ke-ra-me-wo*, *wa-na-ka-te-ro* [p. 85, n. 64]) suggests some degree of administrative interest in this industry. Compare also MY Wt 501-7 and Ue 611, which record the delivery of various types of pottery (Sacconi 1999: 545–6).

### Batch-marking

As mentioned above (p. 91, n. 96), the relatively small number of ISJs is usually explained as due to a batch-marking system, whereby a single ISJ would function as a 'label' for a whole batch of SJs. Olivier 1996–1997: 282–3 argues that such a system could only have operated for the first stage of the (I)SJs' transportation, from the pottery workshop where they were produced to the place where they would be filled with oil, and therefore argues that the ISJs must be recording the fulfilment of the potters' obligation to produce a batch of jars. Additionally, for the potters to be painting the oil producers' names, a more complex administrative system would be needed to inform the potters in advance how many jars were required and with what inscription – which Olivier regards as implausible. However, given the level of administrative control seen on the Linear B tablets, such a system does seem possible (and would avoid potential problems of over- or under-production of jars). Alternatively, the single ISJ needed by each oil producer to mark their batch could be produced without advance knowledge of the total number of SJs required: in this case there would be no need to preserve an *empty* batch between the potters' workshop and the oil producer,<sup>108</sup> as the ISJ would begin to act as a 'label' only once the filled jars were being delivered to the 'collector' or administrative centre. The hypothesis of a batch-marking system is therefore compatible with the PNs representing either the potter or the oil producer.<sup>109</sup>

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**108** It is unclear how close the sites of production of the jars and the oil may have been to each other – see below.

**109** Another issue with this hypothesis is why, if a single ISJ was produced for each batch, ISJs with the same inscription are so often (though not always) found together. Possibly more than one jar could sometimes have been marked per batch (van Alfen 1996–1997: 272); equally, the groups found together could represent multiple original batches. Ultimately, we know so little about the movements of ISJs between production and deposition that nothing can really be said about these groupings: as J. Bennet has pointed out (pers. comm.), the diverse origins of the SJs found at each site, and the evidence for reuse provided by SJ stoppers at Mycenae (p. 91, n. 97), suggest that each (I)SJ could have gone through multiple cycles of reuse/re-shipping.

### ‘Producer’: ‘collector’ ratio

There are no ISJ examples of a single ‘collector’ being associated with more than one producer; indeed, the **wa-to** jars show three groups of ISJs from the same location, with three different ‘producers’ and three different ‘collectors’.<sup>110</sup> If this were directly parallel to the KN D-series (p. 84) one would expect a single ‘collector’ to control several ‘producers’.<sup>111</sup> Olivier 1996–1997: 280, n. 46 explains this as due to the difference between the sheep and pottery industries: a ‘collector’ would only need a single potter/pottery workshop as opposed to the large numbers of flocks of sheep needed for wool production. However, it seems equally possible that within the oil industry a single ‘collector’ might have controlled only a single oil-producing workshop. Since single-PN inscriptions form the majority of the ISJs, it is difficult to say whether the **wa-to** jars are indicative of the overall structure of the ‘collector’ system.<sup>112</sup>

### Scientific analyses<sup>113</sup>

The question of whether the ISJs’ places of manufacture are the same as the TNs in their inscriptions is crucial. If it could be shown that **EL Z 1**, for instance, was made at or near *da-\*22-to*, this would be compatible with either hypothesis, since in the absence of evidence to the contrary the natural assumption is that the jars were produced near the place they would be filled.<sup>114</sup> But if it could be shown that it was *not* made at *da-\*22-to*, this would mean that the inscription could not refer to the manufacture of the jar itself – i.e. the PN would be the oil producer’s.

Much of the evidence seems to suggest that the ISJs were produced at their TNs. That the **wa-to** jars are in the same chemical group (WCβ)<sup>115</sup> and have the same typology suggests that jars bearing the same TN were manufactured in the

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**110** It has been suggested that the missing TN on **TH Z 850** is *wa-to* (Björck 1954: 120–1; van Alfen 1996–1997: 270, n. 63). If this is correct (this jar also matches the **wa-to** jars in composition and typology [TSJ: Table 27]) this would give a fourth set of PNs at this location.

**111** Carlier 1984: 66, n. 355.

**112** Duhoux 2011: 67–8, regarding these ‘collectors’ as belonging to the kingdom of Khania, suggests that its administrative structure may have differed from Knossos; but there is currently no consensus over the status of Khania at this period (p. 70).

**113** On the following discussion, see TSJ: 102–5 and Table 27.

**114** van Alfen 1996–1997: 268–9.

**115** **TH Z 846** is WC but not assigned to an α/β group; **TH Z 853** is probably WCβ.

same place, plausibly (but not certainly) *wa-to* (a west Cretan TN).<sup>116</sup> **TH Z 839**, with the west Cretan ethnic *o-du-ru-wi-jo*, is WC $\alpha$ , suggesting manufacture at a different west Cretan location from the *wa-to* jars; while **EL Z 1** is consistent with manufacture near Rethymnon,<sup>117</sup> which would fit with *da-\*22-to*'s location in western-central Crete.

However, **MY Z 202**, probably bearing the TN *e-ra*, is also WC $\beta$ . Although this does not prove it was made at the same place as the *wa-to* jars (whose typology it does not share), *e-ra* is located in central/western-central Crete – so this could provide evidence of ISJs being made in a place different from their TN. Since it is not even certain that this word is complete, though, it cannot be securely identified with *e-ra*.<sup>118</sup>

*TSj*: 104 also reports that both Haskell and Day believe that the west Cretan ISJs are so typologically and petrographically similar that they are likely to have been made in a small area near Khania – i.e. that fewer places of manufacture than TNs are involved – and that if this is the case (which cannot currently be proven or disproven) the PNs could not be those of the potters. If jars were being made in a single centre at/near Khania (probably in more than one workshop, given the  $\alpha$  and  $\beta$  clay types) and dispatched from there to other oil-producing areas, this could be due either to the availability of suitable clay only in this region, or a desire for close administrative control over the production of the jars and their inscriptions. The former does not seem likely – clay suitable for coarseware would presumably have been widely available. The latter is, however, possible; little can be said given our ignorance of the situation in west Crete at this period (and, indeed, of the precise locations of the TNs in question). The evidence of the scientific analyses is thus highly inconclusive.

## Palaeography

The ability of palaeography to provide evidence for this question lies in the possibility of identifying the hands responsible for the inscriptions. Sacconi 2012: 128–30 identifies twenty-one such hands, assigning them the numbers 501–521. I shall not, however, employ this numbering here, not only because (as I shall

<sup>116</sup> On the locations of Cretan TNs, see Bennet 1985: 233–9.

<sup>117</sup> Its chemistry, Group X, indicates manufacture either near Rethymnon or in east Crete; its west Cretan typology suggests the former.

<sup>118</sup> **TI Z 27** (TN *\*56-ko-we*) and **TI Z 29** (which may bear the ethnic *si-ra-ri-jo*) have not been analysed.

discuss below) certain of my attributions differ from hers, but also for methodological reasons. The use of a numbering system such as is used to identify the scribes responsible for Linear B tablets, and indeed the term ‘scribe’, imply that the painters of the ISJs had a similar status to the scribes of the tablets, something that is extremely unlikely to be the case for the vast majority of painters, in terms of either their bureaucratic and social positions or their level of literacy.<sup>119</sup> Moreover, the assignation of hand numbers to ISJ painters implies that these can be identified with a degree of security comparable to that of tablet hands, which is unfortunately far from being the case. The palaeography of the ISJs is much less well understood than that of tablets; little is known for certain about the circumstances of the inscriptions’ production, and there remains the possibility that some painters may have been copying from models; and the (relatively small) corpus consists mainly of extremely short inscriptions.<sup>120</sup> It should thus be borne in mind that, although I shall attempt to distinguish between inscriptions attributable to different painters, all such identifications are made on the balance of probability given the limited evidence available, and none can be regarded as entirely secure.

These difficulties notwithstanding, ISJs with the same inscription, as well as falling into the same chemical, petrographic, and typological groups (supporting an origin in the same workshop), almost always have very similar or identical sign-forms and layout, to the extent that it seems likely that they originate from a single hand (or were copied from the same model).<sup>121</sup> For instance, all the members of the *a-re(-i-)me-ne* group display almost identical sign-forms (NB particularly the *me* and *ne*, and the signs’ elongated appearance), with word-dividers consistently used between the second and third terms only, and the inscriptions arranged in the same way (signs of similar height ‘hanging’ from the band around the top of the belly); all four are analysed as WCβ, and the two of which enough is preserved for typological analysis are both in typegroup VIII (TSJ: 92–3, Illustration 8.1).<sup>122</sup> It thus seems likely, subject to the caveats given above, that these were all painted by the same person.

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<sup>119</sup> See p. 72–3 on EL Z 1.

<sup>120</sup> Olivier 1967: 101 suggests a minimum of 30 different syllabograms for the secure assignation of a scribal hand; no ISJ has more than 12 different syllabograms, and most have no more than three or four.

<sup>121</sup> TSJ: 97.

<sup>122</sup> The difference in spelling may be either an accidental omission, such as is also seen on tablets (Ilievski 1965: 49) or an example of plene vs. regular spelling of a diphthong in *-i-*, depending on the precise phonetic interpretation of this name (García Ramón 2008: 333); alternations between spellings with and without *-i-* are seen in KN Hands 103 and 128 (Olivier

The question is whether this apparent one-to-one correspondence of hand to inscription is universal. If the same inscription were always painted by the same hand, *and* a single painter never painted more than one inscription, it would seem that each potter was painting his own name (it seems unlikely that each individual oil producer should have their own personal potter). Conversely, if any painter has painted two or more different inscriptions, or if there are examples of the same inscription being painted by different hands, this would show that the PNs are *not* those of the individual potters. It would not, however, constitute positive proof that these represent the oil producers, since it would be equally possible that several potters, all working in the same workshop, could have painted the name of the workshop manager.<sup>123</sup>

### Are different inscriptions always painted by different hands?

TSJ: 104 cites as support of the potter hypothesis the fact that ‘there appears to be no certain case among the inscribed jars of two different inscriptions being painted by the same painter’.<sup>124</sup> The problem is that in most cases there is very little direct evidence either for or against this. How could it be said, for instance, that **MA Z 1** and the *a-do-we* group – all WCα dark-on-light jars, with similarly-arranged inscriptions, but with no signs in common for comparison – are definitely not by the same hand, any more than that they definitely are?

Sacconi 2012: 129, however, identifies the *a-re-(i-)me-ne* and *pi-pi* groups as belonging to the same hand (‘501’): if this is the case, it would be fairly strong evidence for the PNs being those of the oil producers. As the only signs all of the *wa-to* jars have in common are *wa* and *to*, which tend to differ little between hands, the only way to compare them is through similarities or differences in for-

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1967: 99). Cf. the *ta-(\*22-)de-so* jars, which are palaeographically identical (note particularly the *de* – see above, p. 76) apart from the alternation in spelling; this might be phonetic in origin (Melena 1987: 221ff.), or might again be simply an accident.

**123** A role analogous to that posited by van Alfen 1996–1997: 268–9 for the ‘manager’ of an oil-production workshop, who, as the person accountable for the workshop’s production, would be the one to have his name inscribed.

**124** Demakopoulou–Divari-Valakou 1994–1995: 327 reports a remark by J. L. Melena that ‘the inscription on **MI Z 4** recalls the inscriptions on **KH Z 5** and **TH Z 869**], belonging to the same graphic tradition and deriving perhaps from the same hand’. However, the latter two jars (in the *ta-(\*22-)de-so* group) have no signs in common with **MI Z 4**, nor do they share a similar positioning of their inscriptions. As the *ta-(\*22-)de-so* group is west Cretan and **MI Z 4** probably central Cretan, it is unlikely that these derive from the same workshop or hand.

matting. The simplified and widely-spaced sign-forms on **TH Z 853** are very different from the other *wa-to* jars, but in my view significant differences can also be seen between the *pi-pi* and *a-re-(i-)me-ne* groups. While the former displays signs of similar height arranged as though between parallel lines, the latter's very elongated signs differ in height but all seem to hang from the same level at the top: this consistent difference strongly implies that these were painted by different people, as does the difference in the use, form, and position of the word-divider (J. T. Killen, pers. comm.).<sup>125</sup> The existence of (at least) three different formulae from the same location apparently painted by three different hands would suggest fairly strongly that these represent the names of the potters.<sup>126</sup>

### Is the same inscription always painted by the same hand?

The *wi-na-jo* group provides particularly strong evidence for this, as the only significant example of a group whose places of origin differ.<sup>127</sup> **AR Z 1** is Group X, so that *TSJ* (Table 27) suggests an origin in western-central Crete relatively near its find-spot, while **KN Z 1716** (chemically CC/B, Cretan typology) is central Cretan; **MI Z 4** has not been analysed, but is typologically close to **KN Z 1716**. It thus appears that these jars were produced in at least two different locations. Their shared inscription could be explained as due to *wi-na-jo* being a common name,<sup>128</sup> were their palaeography not almost identical: all three share distinctive forms of *wi*, *na*, and *jo* which have no exact parallels in the rest of the ISJ corpus or on tablets. *TSJ*: 100 offers two explanations: either there must have been (at least) two different potters at different sites copying or remembering the same model for this name (which seems implausible);<sup>129</sup> or a single potter could have trav-

<sup>125</sup> If the *e-wa-ko-ro* group is also from *wa-to* (p. 95, n. 110) this would probably be by a fourth hand: in formatting it appears closest to **TH Z 853**, but the form of the *e* seems to differ significantly.

<sup>126</sup> *TSJ*: 104–5. I can see no good basis for the suggestion in Consani 1980: 72 that the *pi-pi* group is by two different painters, a ‘master’ and an ‘apprentice’.

<sup>127</sup> *TSJ*: 99–100. The *pi-pi*, *pu-ti*, and *ta-(\*22-)de-so* groups each have some members classed as WCα and some as WCβ; however, their jars are all close in composition, and the difference in calcium content indicated by the α/β division is really a continuous spectrum (*TSJ*: 82).

<sup>128</sup> There are probably at least three different people called *wi-na-jo* in the Knossos tablets (Landenius Enegren 2008: 88).

<sup>129</sup> Demakopoulou–Divari-Valakou 1994–1995: 327 state that **MI Z 4** was copied from the same model as the others rather than being painted by the same hand; but, as *TSJ*: 100 points out, it is **KN Z 1716** which differs slightly from the other two in palaeography. The difference does not seem sufficiently significant to suggest a different hand.

elled between the two places (for which travelling potters in modern-day Crete could be a parallel). Either way, the important point is that there is no good way to explain this inscription as an oil producer's name: if this were the case, either the oil producer himself would have to be painting his own name on the jar, or he would have to take his own personal potter with him when moving from one place to the other, neither of which seems likely.<sup>130</sup>

However, this evidence could perhaps be partially contradicted by a number of ISJ groups whose members show some palaeographic differences, and which therefore might be candidates for groups painted by different hands: the *a-nu-to*, *ī-ṛu*, and *no-di-zo* groups.<sup>131</sup>

Sacconi 2012: 129 assigns the jars in the *a-nu-to* group to two different scribes based on the form of *a*: **TH Z 863** and **864** have a form with one cross-bar, while **TI Z 8** and **54** and **TH Z 865** have a double-barred form (the *a* is not preserved on **TH Z 961**). However, on tablets variation between these two forms is seen within single scribal hands (Bennett 1986: 140) and even on the same tablet (Olivier 1967: 31), so this cannot be considered significant. It is noticeable that the form on **TI Z 8** is quite differently proportioned, with shorter straight side-strokes instead of long curved ones, but it is not certain that this variation is any more significant.<sup>132</sup>

The last two groups include some of the more 'incompetent' ISJs: the *ṛu-ī* and *di-no-zo* jars (pp. 78–9). The question is whether these same painters also produced the *ī-ṛu* and *no-di-zo* jars.

Sacconi 2012: 129 assigns all the *no-di-zo* and *di-no-zo* jars to the same hand; however, Bennett 1986: 137–9 separated **TI Z 12** from the other *no-di-zo* jars on the grounds that 'only here do the signs *no-di-zo* seem to stand between invisible horizontal rules...and the *zo* seems of a well-proportioned normal shape'. Bennett therefore regarded this as painted by a different hand from the other *no-*

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**130** A system in which oil producers had to be present at the pottery workshops in order to inscribe their own names at the point when the jars had been decorated but not fired seems implausibly complicated – especially since the main evidence for the names being the oil producers' is the suggestion that the jars were produced in a *different* location from their TNs (pp. 95–6).

**131** The *a-do-we* and *kū-ja-ni* groups also appear to include inscriptions with very different forms from the others (**TI Z 25** and **TH Z 971**, respectively), but I follow *TSJ*: 97–9 in regarding the readings of these two ISJs as insecure. Differences in chemical analysis and typology (**TI Z 25** is CC/B while the other *a-do-we* jars are WCα; **TH Z 971** is WCβ dark-on-light while the other *kū-ja-ni* jars are WCα light-on-dark) further support the view that these two jars are not members of these groups. Possible differences in the form of *u* amongst the *u-pa-ta-ro* group are not secure due to the fragmentary nature of most of these ISJs.

**132** Bennett 1986: 139–40 seems not to regard it as such. Note also that the inscription is not complete, so is not entirely certainly part of this group; the jar has not been analysed (*TSJ*: 99).



*di-zo* jars; the *di-no-zo* jars could have been painted by the same hand as these (perhaps at a different time when the original model was no longer present to be copied) or by a third hand.<sup>133</sup>

Due to the fragmentary nature of most of these inscriptions, it is difficult to divide them into sub-groups, but comparing the most complete ones – **TI Z 11** and **12**, and the *di-no-zo* jars – three different dispositions can be seen: **TI Z 12**'s arrangement 'between invisible rules', **TI Z 11**'s downwards-sloping arrangement, and the *di-no-zo* jars' compromise between the two, where the *di* and *no* are level with each other but the *zo* extends further down. Note also the differing proportions of the *zo*, which on **TI Z 11** is taller and thinner than on **TI Z 12**; this is reflected in the *di-no-zo* jars' differing forms of this sign (p. 79). The *di-no-zo* jars, then, give the appearance of having been produced by a painter who had seen inscriptions similar to both **TI Z 11** and **TI Z 12** and conflated elements of the arrangements of both.<sup>134</sup> Given this apparent division into three different formats, and since there is no other ISJ group which shows such a difference in formatting,<sup>135</sup> I am inclined to see this group as the work of at least two, and more probably three, different painters<sup>136</sup> – although, due to the limited evidence, this is unprovable. Equally, a less competent painter might be more prone to inconsistency across several inscriptions.

Regarding the *i-ru* group, by contrast, I can see no way of dividing the three jars into sub-groups. **TH Z 866** and **867** evidently share the order of signs, but **866** is closer to **868** in its form of *ru*, while in the form of *i* **867** seems closer to **868**. This overlapping of features makes me more inclined to agree with Sacconi 2012: 129's attribution of this group to a single hand (rather than with Consani 1980: 82's attribution to two different hands), and to see it as the product of an incompetent painter, whose realisation of the signs varied due to uncertainty as to their correct formation; but again, given the limited evidence available, this hypothesis is unprovable.

<sup>133</sup> Zurbach 2006: 37 contrasts **TI Z 12** (and perhaps **TI Z 16**) with the other *no-di-zo* jars, particularly regarding their form of *no*, but too little of this sign remains on either jar to be certain of its form.

<sup>134</sup> The differences between the two *di-no-zo* jars do not seem sufficient, *pace* Consani 1980: 80, to ascribe them to two different hands.

<sup>135</sup> The exception being **TH Z 971**, already shown (p. 100, n. 131) to be probably *not* a part of the *ku-ja-ni* group. Even groups whose inscriptions are in different positions (e.g. the *wi-na-jo* group) show little formatting difference.

<sup>136</sup> Cf. Zurbach 2006: 37.

## Conclusions

While the weight of the palaeographic evidence appears to be on the side of the identification of the PNs as the potters – implied by the *wi-na-jo* and *wa-to* ISJs, and by the general pattern that single ISJ groups appear to be painted by single hands – there appears to be at least one group, the *no-di-zo* ISJs, which could contradict this. This could perhaps be explained if ISJs were produced both by larger workshops (whose ‘manager’ would be named on the jars) and by single potters (who would paint their own names); but equally it could be taken as evidence in favour of the PNs being those of the oil producers, with the lack of variation in other ISJ groups explained as being due either to painters in a single workshop tending to follow a standard pattern (perhaps due to copying a model), or simply to the paucity of the evidence in terms of both the number of ISJs found and our ability to analyse the significance of palaeographic variation in this medium. The latter explanation, although it seems to account for the palaeographic evidence less well, would fit better with the suggestion prompted by the scientific analyses that the ISJs were produced in fewer places than indicated by their TNs, and therefore that they represent the oil producers; but this cannot be proven, and the rest of the scientific evidence is compatible with either hypothesis.

The current situation regarding these PNs is thus something of a stalemate between different pieces of evidence, none of which is sufficiently conclusive to outweigh the others. Significant progress towards a full understanding of the ISJs has, however, been made in establishing, firstly, that only a minority of inscriptions were not primarily intended to fulfil a communicative function; and secondly, that this primary communicative function formed part of a Cretan administrative system, although determining the precise nature of this administrative system is, as yet, not possible. Moreover, the investigation of the inscriptions’ secondary functions has revealed a wide range of possible functions outside of an administrative context, from decoration to marker of identity or prestige, giving a much more varied view of possible responses to writing in different contexts and at different levels of society than would be suggested by the restricted nature of Mycenaean literacy. It is to be hoped that future discoveries of ISJs will enable further progress to be made regarding both the functions of the inscriptions themselves and the wider questions concerning Mycenaean economy and society for which they could provide such significant evidence.

## Appendix A: ISJ groups

A ‘group’ is here defined as two or more jars which certainly or probably share the same inscription.<sup>137</sup> Groups with long inscriptions are denoted by the first PN only (full texts given in **Appendix B**).

Not all jars in a group necessarily preserve the complete inscription; jars whose inclusion in a group is particularly uncertain for this reason are marked by dots. Inscriptions whose published readings attribute them to a particular group, but whose affiliation to that group seems insecure, are included in square brackets and discussed in **Section 3**.

*a-do-we* group: TH Z 842; TI Z 24, [25]

*a-nu-to* group: TH Z 863, 864, 865, 961; [TI Z 8]

*a-re-(i-)me-ne* group: TH Z 849, 851, 852, 882

*e-wa-ko-ro* group: TH Z 850, 883, 884

*i-ru* group: TH Z 866, 867

*ru-i*: TH Z 868

*ku-ja-ni* group: TH Z 844, 848, 881, [971]

*ku-ru-zo* group: TH Z 840, 841, 843, 845, 856, 879, 959, 960

*no-di-zo* group: TI Z 11, 12, 13, 14, 15, 16, 17, 18, 22, 23; KH Z 27<sup>138</sup>

*di-no-zo*: TH 857, 858

*pi-pi* group: TH Z 846, 854, 878

*pu-ti* group: KH Z 4, 10, 18

*ta-(\*22-)de-so* group: TH Z 869, 870, 871, 872, 876; KH Z 5, 39

*u-pa-ta-ro* group: TI Z 1, 2, 3, 4, 5, 35

*wi-na-jo* group: KN Z 1716; AR Z 1; MI Z 4

The *wa-to* ISJs consist of the *a-re-(i-)me-ne* group and the *pi-pi* group, plus **TH Z 853**. It is also possible that the *e-wa-ko-ro* group may originate from *wa-to* (p. 95, n. 110).

<sup>137</sup> This does not necessarily correspond to palaeographic groupings, on which see **Section 3**.

<sup>138</sup> **TI Z 17, 18, 22**, and **KH Z 27** read only ]no[, but are included as possible members because the sign is identical in its (unusual) form to those seen in the full inscriptions in this group. Other fragments reading ]no[ which are not certainly of this form have not been included.

## Appendix B: Texts of the Longer ISJs<sup>139</sup>

### Three-term inscriptions:

EL Z 1 .1 da-<sup>\*</sup>22-to  
.2 da-pu<sub>2</sub>-ra-zo , wa ,

TH Z 839 ka-u-no o-du-ru-wi-jo , wa-na-ka-te-ro ,

TH Z 846 pi-pi , wa-to , su-ro-no

TH Z 854 ]pi-pi , wa-to , su-ro-no

TH Z 878       wa-]to , su[-ro-]no[

TH Z 849 a-re-ṭ-me-ne wa-to , re-u-ko-jo<sup>140</sup>

TH Z 851 a-ṭ-ṭ-me-ne wa-to , re-u-ko-jo[

TH Z 852 a-re-me-ne wa-to , re-u-ko-jo

TH Z 882       ]-ne[ wa-]to[ ]ṭ-u-ko-jo [

TH Z 853 e-u-da-mo , wa-to , ri-<sup>\*</sup>82-ta-o

### Probable three-term inscriptions:<sup>141</sup>

MY Z 202 ]e-ra , ka-ta-ro

TI Z 29 si-ra-]ṭ-jo , wa-na-ḳa[-te-ro<sup>142</sup>

TH Z 850 e-wa-ko[-ro       ] , ka-ma-ti-jo-jo<sup>143</sup>

### Two-term inscription:

KH Z 43 ze-ta-ro , wa<sup>144</sup>

<sup>139</sup> Texts are those of *CIV* unless otherwise indicated.

<sup>140</sup> I follow the reading of *VIP*: 67; *CIV* reads *a-re-zo-me-ne*, but the photograph (pl. XXX) shows the bars of the third sign to be diverging at the top, which is not compatible with a reading *-zo-* (J. T. Killen, pers. comm.; see García Ramón 2008: 331).

<sup>141</sup> In addition, **TH Z 880** ]ni-jo-jo[ appears to preserve the ending of a noun in the genitive, and so could well have been the final element of a three-term inscription (Duhoux 2011: 88).

<sup>142</sup> Supplements by Godart–Olivier 1975: 39–42.

<sup>143</sup> **TH Z 883** and **TH Z 884a-δ**, which both preserve parts of the PN *e-wa-ko-ro*, may well have originally borne the same inscription as **TH Z 850**.

<sup>144</sup> Hallager 2011: 419.

## Abbreviations

AR = Armenoi  
 CC/B = Central Crete/Boeotia (chemical group)  
 DIM = Dimini  
 EL = Eleusis  
 gen. = genitive  
 ISJ = inscribed stirrup jar  
 KH = Khania  
 KN = Knossos  
 KR = Kreusis  
 LH = Late Helladic  
 LM = Late Minoan  
 MA = Malia  
 MAM = Mamelouko  
 MI = Midea  
 MY = Mycenae  
 nom. = nominative  
 OR = Orchomenos  
 PN = personal name  
 PRI = Prinias  
 PY = Pylos  
 SJ = stirrup jar (uninscribed)  
 TH = Thebes  
 TI = Tiryns  
 TN = toponym  
 WC = West Crete (chemical group; subdivided into WC $\alpha$  and WC $\beta$ )

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